What is claimed:

1. A lightweight structural component comprising:

at least one panel;

at least one stiffening element;

the at least one stiffening element comprising two side pieces; and

each of the two side pieces being at least partially connected to the at least one panel in a material-locking manner,

wherein the two side pieces are connected to the at least one panel at two separate joint zones.

2. The component of claim 1, wherein the component is utilized in an aircraft and the at least one stiffening element is oriented at least one of a lengthwise and a crosswise direction relative to the at least one panel.

3. The component of claim 1, wherein the at least one panel comprises a skin sheet.

4. The component of claim 1, wherein the at least one panel comprises a thickened region in an area of the two separate joint zones.

5. The component of claim 1, wherein the at least one stiffening element comprises a stringer which is oriented in a lengthwise manner.

6. The component of claim 1, wherein the at least one stiffening element comprises a rib that runs in a circumferential direction.

7. The component of claim 1, wherein the two separate joint zones comprise laser beam weld zones.

8. The component of claim 1, wherein the two separate joint zones comprise friction stir weld zones.

9. The component of claim 1, wherein the two separate joint zones comprise surfaces which are adhered to.

10. The component of claim 1, wherein the two separate joint zones comprise adhesive bonded joint zones.

11. The component of claim 1, wherein the at least one panel comprises a panel stiffening base having an outer portion and an inner portion arranged between inner surfaces of the two side pieces.

12. The component of claim 11, wherein the inner portion comprises a thickness d_{Hv} that is greater than a thickness d_{Hs} of the outer portion and wherein side surfaces of the inner portion rest against or adjacent to inner surfaces of the two side pieces.

13. The component of claim 12, wherein the two separate joint zones respectively extend at least partially up to the side surfaces of the inner portion.

14. The component of claim 1, wherein the two side pieces are bent or oriented away from each other by a total angle α, whereby inner surfaces of the two side pieces and a surface of the at least one panel form a generally isosceles triangle.

15. The component of claim 14, wherein the angle α lies in a range of between approximately 7° and approximately 50°.

16. The component of claim 1, wherein the at least one stiffening element comprises the following:

a ratio between a side piece thickness t_s in a plane of each joint zone and a thickness d_s of the at least one stiffening element comprises approximately $0.5 \leq t_s/d_s \leq$ approximately 1.8;

a ratio between each side piece length s_s and a height h_s of the at least one stiffening element comprises approximately $0.15 \leq s_s/h_s \leq$ approximately 0.7; and

an angle β between the panel and each joint surface of each joint zone comprises approximately $0° \leq \beta \leq$ approximately 25°.

17. The component of claim 16, wherein the at least one stiffening element further comprises the following:

a ratio of each side piece thickness b_{s0} near a branching of the two side pieces and a side piece thickness t_s in a plane of each joint zone comprises approximately $0.28 \leq b_{s0}/t_s \leq$ approximately 1.

18. The component of claim 1, wherein the two side pieces are bent or oriented at a total angle α of approximately 180°, whereby inner surfaces of the two side pieces rest on a surface of at least one panel.

19. The component of claim 18, wherein the two side pieces are integrally formed with the at least one stiffening element, whereby the at least one stiffening element and the two side pieces comprise a one-piece member.

20. The component of claim 1, wherein the two side pieces are integrally formed with the at least one stiffening element, whereby the at least one stiffening element and the two side pieces comprise a one-piece member.

21. The component of claim 1, wherein the two side pieces comprise tapered surfaces, whereby a thickness of the two side pieces near a bar portion of the at least one stiffening element is less than a thickness of the two side pieces near the two separate joint zones.

22. The component of claim 1, wherein the at least one stiffening element comprises a generally U-shaped profile, whereby the two side pieces are arranged on opposite ends of a head of the at least one stiffening element.

23. The component of claim 22, wherein the two side pieces of the generally U-shaped profile are parallel to each other.

24. The component of claim 1, wherein the at least one stiffening element comprises an edge area which is oriented in a generally parallel manner relative to the at least one panel.

25. The component of claim 1, wherein the at least one panel comprises a panel reinforcing base portion which comprises a first base portion and a second base portion separated from the first base portion, wherein lateral outer surfaces of the first and second base portions rest against or adjacent to inner surfaces of the two side pieces.

26. The component of claim 1, wherein an area of the at least one panel comprising the two joint zones comprises a surface formed by metal cutting.

27. The component of claim 1, wherein an area of the at least one panel comprising the two joint zones comprises a surface formed by metal removal.

28. The component of claim 1, wherein at least one of the two side pieces comprises cut-outs.

29. The component of claim 1, wherein at least one of the two side pieces comprises a plurality of through openings.

30. The component of claim 1, wherein each of the two side pieces comprises cut-outs and wherein the cut-outs are arranged at generally regular intervals "a".

31. The component of claim 1, wherein each of the two side pieces comprises through openings arranged at generally regular intervals "a".

32. The component of claim 31, wherein a distance between an edge of the through openings and joint surfaces of the two joint zones is greater than approximately one and a half times a side piece thickness t_s measured in a plane of each joint zone.

33. The component of claim 31, wherein the through openings in one of the two side pieces are spaced from each other by a distance "a" and wherein the through opening of the other of the two side pieces are spaced from the through openings of the one of the two side pieces by a distance of approximately a/2.

34. The component of claim 31, wherein the through openings comprise circular openings.

35. The component of claim 31, wherein the through openings comprise polygonal openings.

36. The component of claim 31, wherein the through openings comprise non-circular openings.

37. The component of claim 31, wherein the through openings comprise triangular openings.

38. The component of claim 37, wherein the triangular openings comprise approximately equal-sided triangular openings with rounded corners, and wherein vertices of adjacent triangular openings point in opposite directions.

39. The component of claim 1, further comprising a doubler plate made of a damage-tolerant fiber-reinforced laminate attached to outer surfaces of the two side pieces.

40. The component of claim 1, further comprising at least one stress relief element located inside the at least one panel.

41. The component of claim 40, wherein the at least one panel comprises a thickened panel base arranged in an area of the two separate joint zones and wherein the at least one stress relief element is arranged within the thickened panel base.

42. The component of claim 41, wherein the at least one stress relief element is arranged beneath a bar portion of the at least one stiffening element and between the two separate joint zones.

43. The component of claim 40, wherein the at least one stress relief element comprises a material having a higher modulus of elasticity and a higher fatigue strength than a material of the at least one panel.

44. The component of claim 40, wherein the at least one stress relief element comprises a plurality of stress relief elements.

45. The component of claim 40, wherein the at least one stress relief element comprises a plurality of spaced apart stress relief elements.

46. The component of claim 40, wherein the at least one stress relief element comprises a high-strength wire cable.

47. The component of claim 40, wherein the at least one stress relief element is located directly beneath a panel stiffening base of the at least one panel and is centrally disposed between the two separate joint zones.

48. The component of claim 47, wherein the panel stiffening base is integrally formed with the at least one panel, whereby the panel stiffening base and the at least one panel comprise a one-piece member.

49. The component of claim 1, wherein the at least one panel comprises a panel stiffening base made of material that is deformed during a rolling-in of a stress relief element into the at least one panel.

50. The component of claim 1, wherein the at least one panel comprises a panel stiffening base made of material that is deformed during a rolling of the at least one panel.

51. The component of claim 1, wherein the at least one panel comprises a plurality of panel bars arranged generally parallel to one another and generally parallel to the at least one stiffening element.

52. The component of claim 1, wherein the at least one panel comprises a plurality of panel bars arranged generally parallel to one another and generally perpendicular to the at least one stiffening element.

53. The component of claim 1, wherein the at least one panel comprises a plurality of panel bars, some of which are arranged generally parallel to one another and some of which are arranged generally perpendicular to one another.

54. The component of claim 1, wherein the at least one panel comprises a plurality of panel stiffening bases and a plurality of panel bars, wherein a height of the panel bars generally corresponds to a height of the panel stiffening bases, wherein the at least one stiffening element comprises a plurality of stiffening elements, and wherein a spacing between the stiffening elements is generally equal to an integral multiple of a spacing "C" between the panel bars.

55. The component of claim 1, wherein the at least one stiffening element comprises a head portion that is coupled to a bar portion.

56. The component of claim 55, wherein the head portion projects from both sides of the bar portion.

57. The component of claim 56, wherein the head portion projects by generally equal amounts from both sides of the bar portion.

58. A lightweight structural component comprising:

at least one panel comprising at least one thickened region;

at least one stiffening element coupled to the at least one panel;

the at least one stiffening element comprising a bar portion and two side pieces; and

each of the two side pieces being at least partially connected in a material-locking manner to the at least one thickened region by two separate joint zones,

whereby the at least one stiffening element is oriented in at least one of a lengthwise and a crosswise direction.

59. The component of claim 58, further comprising a reinforcing element located in a cavity formed by the two side pieces and a surface of the at least one thickened region.

60. The component of claim 59, wherein the at least one thickened region comprises a panel stiffening base and wherein the reinforcing element comprises a high-strength material having a modulus of elasticity that is generally greater than a modulus of elasticity of a material of at least one of the at least one panel and the at least one stiffening element.

61. The component of claim 60, wherein the reinforcing element is connected to at least one of the two side pieces and to the at least one panel stiffening base in one of a force-locking manner and a form-locking manner.

62. The component of claim 58, wherein the component is arranged on an aircraft.

63. The component of claim 58, wherein the at least one stiffening element comprises a stringer oriented in a lengthwise direction.

64. The component of claim 58, wherein the at least one stiffening element comprises a rib oriented in a circumferential direction.

65. The component of claim 58, wherein the two separate joint zones comprise laser beam weld zones.

66. The component of claim 58, wherein the two separate joint zones comprise friction stir weld zones.

67. The component of claim 58, wherein the two separate joint zones comprise surfaces which are adhered to.

68. The component of claim 58, wherein the two separate joint zones comprise adhesive bonded joint zones.

69. The component of claim 58, wherein the two joint zones comprise panel surfaces and surfaces of the two side pieces, and wherein each of the panel and two side piece surfaces comprises a machined surface.

70. The component of claim 58, further comprising a reinforcing element having surfaces which are both force-locked and form-locked to at least one of inner surfaces of the two side pieces and a surface of the thickened region.

71. The component of claim 70, wherein the surfaces comprise at least one of a rough profile and surface profiling.

72. The component of claim 58, further comprising a reinforcing element which comprises surfaces which are fixed to at least one of inner surfaces of the two side pieces and a surface of the thickened region.

73. The component of claim 58, further comprising a cavity formed by the two side pieces and the at least one thickened region and a reinforcing element arranged within the cavity.

74. The component of claim 73, wherein a cross-sectional shape of the cavity generally corresponds to a cross-sectional shaped of the reinforcing element.

75. The component of claim 74, wherein the cavity comprises a cross-sectional shape having a form of a generally equal isosceles triangle with a rounded-off apex.

76. The component of claim 74, wherein the reinforcing element comprises a cross-sectional shape having a form of a generally equal isosceles triangle with a rounded-off apex.

77. The component of claim 58, further comprising at least one reinforcing element arranged within the at least one thickened region.

78. The component of claim 58, further comprising at least one reinforcing element arranged between the two side pieces, wherein the at least one reinforcing element comprises one of a wire, a rod, a wire rope, a pipe and a tube.

79. The component of claim 78, wherein the at least one thickened region comprises a curved surface and wherein the two side pieces comprises curved inner surfaces, whereby the curved surfaces enclose the at least one reinforcing element.

80. The component of claim 79, wherein the two side pieces contact at least approximately 180° of a circumferential surface of the at least one reinforcing element.

81. The component of claim 79, wherein the two side pieces comprise portions which are arranged parallel to one another, whereby a spacing between inner surfaces of the two side pieces generally corresponds to a diameter of the at least one reinforcing element.

82. The component of claim 58, wherein the at least one thickened region comprises a panel stiffening base which contains a recess adapted to receive a reinforcing element.

83. The component of claim 58, further comprising a plurality of cut-outs arranged in at least one of the bar portion and the two side pieces, wherein the cut-outs are arranged at regular intervals "a".

84. The component of claim 58, further comprising a plurality of through openings arranged in at least one of the bar portion and the two side pieces, wherein the through openings are arranged at regular intervals "a".

85. The component of claim 58, further comprising a plurality of through openings arranged in at least one of the bar portion and the two side pieces.

86. The component of claim 85, wherein the through openings comprise a circular through openings.

87. The component of claim 85, wherein the through openings comprise non-circular through openings.

88. The component of claim 85, wherein the through openings comprise polygonal through openings.

89. The component of claim 85, wherein the through openings comprise generally approximately equilateral triangular through openings with rounded-off corners.

90. The component of claim 89, wherein adjacent triangular through openings are oriented in opposite directions.

91. The component of claim 85, wherein the through openings of one of the two side pieces are arranged offset from the through openings of another of the two side pieces, whereby a distance between the through openings of each of the two side pieces comprises a value "a", and whereby a distance between each of the through openings of one of the two side pieces and each of the through openings of another of the two side pieces comprises a value of approximately a/2.

92. The component of claim 58, further comprising a plurality of stress relief elements arranged within the at least one thickened region.

93. The component of claim 92, wherein at least one of the plurality of stress relief elements is arranged on one side of the bar portion and wherein at least another of the plurality of stress relief elements is arranged on another side of the bar portion.

94. The component of claim 92, wherein at least one of the plurality of stress relief elements is arranged near each of the two separate joint zones.

95. The component of claim 92, wherein at least one of the plurality of stress relief elements comprises a material having a higher modulus of elasticity and a higher fatigue strength than a material of the at least one panel.

96. The component of claim 92, wherein at least one of the stress relief elements comprises a high-strength wire cable.

97. The component of claim 58, wherein the at least one panel comprises a sheet skin for one of an aircraft, a boat and a ship.

98. The component of claim 58, wherein the at least one panel comprises a plurality of integrally formed panel bars .

99. The component of claim 98, wherein the plurality of panel bars are arranged generally parallel to the at least one stiffening element.

100. The component of claim 98, wherein the plurality of panel bars are arranged generally perpendicular to the at least one stiffening element.

101. The component of claim 98, wherein the plurality of panel bars are arranged generally parallel to one another and generally parallel to the at least one stiffening element.

102. The component of claim 98, wherein a height of the panel bars corresponds to a height of the at least one thickened region.

103. The component of claim 98, wherein the at least one stiffening element comprises a plurality of stiffening elements which are spaced apart from

one another by an amount equal to an integral multiple of a spacing "C" of the panel bars.

104. The component of claim 58, wherein the at least one stiffening element comprises a head which is centrally disposed on the bar portion.

105. A method of producing the lightweight structural component of claim 1, the method comprising:

milling the at least one panel to form at least one thickened region; and

extruding the at least one stiffening element;

subjecting the at least one panel to tension;

subjecting the at least one stiffening element to tension; and

joining the two side pieces to the at least one thickened region at the two separate joint zones.

106. A method of producing the lightweight structural component of claim 1, the method comprising:

milling the at least one panel to form at least one thickened region; and

joining the two side pieces of the at least one stiffening element to the at least one panel at the two separate joint zones.

107. The method of claim 106, further comprising extruding the at least one stiffening element.

108. The method of claim 106, further comprising subjecting the at least one panel to tension.

109. The method of claim 106, further comprising subjecting the at least one stiffening element to tension.

110. The method of claim 106, wherein the joining comprises joining the two side pieces to the at least one thickened region by laser beam welding.

111. The method of claim 106, wherein the joining comprises joining the two side pieces to the at least one thickened region by laser beam welding, and wherein a laser beam focus is formed such that it is one of extended in a feed direction and divided into two partial beams.

112. The method of claim 106, wherein the joining comprises joining the two side pieces to the at least one thickened region by friction stir welding.

113. The method of claim 106, wherein the joining comprises joining the two side pieces to the at least one thickened region by adhesion.

114. The method of claim 106, wherein the joining comprises joining the two side pieces to the at least one thickened region by adhesive bonding.

115. The method of claim 106, wherein the joining comprises simultaneously joining the two side pieces to the at least one thickened region.

116. The method of claim 106, wherein the joining comprises unilaterally joining the two side pieces to the at least one thickened region.

117. The method of claim 106, wherein the joining comprises joining the two side pieces one at a time to the at least one thickened region.

118. The method of claim 106, further comprising, before the joining, forming the two side pieces by extrusion.

119. The method of claim 106, further comprising extruding the at least one stiffening element and the two side pieces to form a one-piece extruded member.

120. The method of claim 106, further comprising forming the at least one stiffening element as an extruded rib, wherein the two side pieces comprise inner curved surfaces, and wherein the thickened region comprises a curved surface.

121. The method of claim 106, wherein the milling comprises chemical milling.

122. The method of claim 106, wherein the milling comprises mechanical milling.

123. The method of claim 106, wherein the milling comprises HSC milling.

124. The method of claim 106, further comprising extruding the at least one stiffening element and thereafter forming the two side pieces by splitting, whereby the splitting utilizes press rollers.

125. The method of claim 106, further comprising extruding the at least one stiffening element and thereafter forming the two side pieces by rolling.

126. The method of claim 106, further comprising positioning a reinforcing element between the two side pieces of the at least one stiffening element and a surface of the at least one thickened region.

127. The method of claim 106, further comprising connecting a reinforcing element to at least one of the two side pieces of the at least one stiffening element and a surface of the at least one thickened region.

128. The method of claim 106, further comprising connecting by mechanical deformation a reinforcing element to at least one of the two side pieces of the at least one stiffening element and a surface of the at least one thickened region.

129. The method of claim 128, wherein the mechanical deformation comprises rolling-in.

130. The method of claim 127, wherein the connecting comprises at least one of force-locking and form-locking connecting.

131. The method of claim 106, further comprising forming by co-extrusion the at least one stiffening element and a reinforcing element.

132. The method of claim 106, further comprising, before the joining, tensioning at least one of the at least one stiffening element and the at least one panel.

133. The method of claim 106, further comprising, during the joining, tensioning at least one of the at least one stiffening element and the at least one panel.

134. A method of producing the lightweight structural component of claim 58, the method comprising:

milling the at least one panel to form the at least one thickened region; and

joining the two side pieces to the at least one thickened region at the two separate joint zones.

135. A method of producing the lightweight structural component of claim 58, the method comprising:

milling the at least one panel to form the at least one thickened region;

forming as a one-piece member the at least one stiffening element and the two side pieces; and

joining the two side pieces to the at least one thickened region at the two separate joint zones.

136. A lightweight structural component comprising:

a metal panel comprising at least one thickened region;

at least one stiffening element coupled to a surface of the at least one thickened region;

the at least one stiffening element being a one-piece metal member and comprising a head portion, a bar portion and two side pieces extending from the bar portion;

the bar portion comprising a first thickness;

each of the two side pieces comprising a second thickness;

the first thickness being greater than the second thickness; and

ends of the two side pieces being at least partially connected to the at least one thickened region by two separate non-removably connected joint zones.

137. The component of claim 136, wherein the bar portion and two side pieces of the at least one stiffening element form a generally Y-shaped cross-section.

138. The component of claim 136, wherein the bar portion and two side pieces of the at least one stiffening element form a generally T-shaped cross-section.

139. The component of claim 136, wherein the at least one stiffening element has a generally I-shaped cross-section.

140. The component of claim 136, wherein a distance between the two separate joint zones is greater than the first thickness.

141. The component of claim 136, wherein a distance between the two separate joint zones is greater than the second thickness.

142. The component of claim 136, wherein a distance between inner edges of the two separate joint zones is greater than the first thickness.

143. The component of claim 136, wherein a distance between inner edges of the two separate joint zones is greater than the second thickness.